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10/501,333	07/23/2004	Naoto Ohta	256241US0PCT	9835
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
BEST, ZACHARY P				
ART UNIT		PAPER NUMBER		
1795				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/501,333

Applicant(s)

OHTA ET AL.

Examiner

Zachary Best

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5 and 8-28 is/are pending in the application.
- 4a) Of the above claim(s) 22-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5,8-21,28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

**NEGATIVE ELECTRODE MATERIAL FOR
LITHIUM ION SECONDARY BATTERY**

Examiner: Z. Best S.N. 10/501,333 Art Unit: 1795 December 9, 2008

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 27, 2008 has been entered. Claims 1 and 13 have been amended. Claims 21-28 have been newly added.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

3. Newly submitted Claims 22-27 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 22-27 and Claims 1, 5, 8-21, and 28 are related as process of making and product made, respectively. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP §

806.05(f)). In the instant case the product can be baked without requiring the nitrogen or argon gas (specification, page. 15) or being dry-blended with a first resin powder.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, Claims 22-27 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

4. The rejections under 35 U.S.C. 112, first paragraph of Claims 13-20, as failing to comply with the written description requirement, are maintained. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. A graphite powder may be different from another, for use as an anode material, in terms of chemistry (purity), shape (e.g., flake, oval, spherical), and density, and the broad scope of such claim was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Examiner suggests the following amendment: "...a mixture of two different coated graphite powders different in average particle size from each other, which are each..."

Claim Rejections - 35 USC § 102 / 103

5. Claims 1, 5, 8-12, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yoon et al. (U.S. Patent No. 6,596,437 B2).

Regarding Claims 1, 5, and 8-10, Yoon et al. teach an anode material for a lithium ion secondary battery comprising a coated graphite powder coated with a carbonized material of thermoplastic resin as a raw material (see claim 1) with an average particle size between 10-50 μm (see col. 5, lines 22-23), wherein the peak strength ratio (I_{360}/I_{580}) is 0.4 or less (see col. 5, lines 39-42). It is the Examiner's position that the other properties of the anode material of Yoon et al., such as the interior pore portions, mesopore volume, standard deviation of particle size, rate of oxidation loss, specific surface area, H/C value, L(112) spacing, accumulative pore volume difference, and change in mesopore volume due to coating, are inherent, given that the anode material of Yoon et al. and the present application have similar process steps, the peak strength ratios (I_{360}/I_{580}), interlayer spacings d_{002} , and precursor materials. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the mesopore volume, cumulative pore volume difference, and change in mesopore volume due to coating to by changing the thickness of

the coating in order to resist a lowered battery capacity due to electrolyte penetration (see Yoon et al., col. 5, lines 43-56).

Regarding Claim 8, Yoon et al. teach the interlayer spacing d_{002} of the core graphite between 0.335-0.342 nm (see col. 5, lines 37-40).

Regarding Claim 11, Yoon et al. teach the coated graphite powder is coated with carbonized material of thermoplastic resin of a carbonization yield of 10-20% (see Example 1 and Example 3), and Yoon et al. teach the ratio of thermoplastic to graphite powder (see Example 1 and Example 3).

Regarding Claim 12, Yoon et al. teach the thermoplastic resin may be polyvinyl alcohol (see claim 4).

Regarding Claim 21, Yoon et al. teach the anode material as recited above. It is noted that Claim 21 is a product-by-process claim. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed.Cir. 1985). The battery taught by Yoon et al. anticipates or is obvious to that of Applicant's, and therefore, Applicant's process is not given patentable weight in this claim.

Claim Rejections - 35 USC § 103

6. Claims 13-20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al (U.S. Patent No. 6,596,437 B2) in view of Aihara et al. (JP 2001-196097).

Regarding Claims 13-18, Yoon et al. teach an anode material for a lithium ion

secondary battery comprising a coated graphite powder coated with a carbonized material of thermoplastic resin as a raw material (see claim 1) with an average particle size between 10-50 μm (see col. 5, lines 22-23), wherein the peak strength ratio (I_{360}/I_{580}) is 0.4 or less (see col. 5, lines 39-42). It is the Examiner's position that the other properties of the anode material of Yoon et al., such as the interior pore portions, mesopore volume, standard deviation of particle size, rate of oxidation loss, specific surface area, H/C value, L(112) spacing, accumulative pore volume difference, and change in mesopore volume due to coating, are inherent, given that the anode material of Yoon et al. and the present application have similar process steps, the peak strength ratios (I_{360}/I_{580}), interlayer spacings d_{002} , and precursor materials. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999). However, Yoon et al. fail to disclose a coated graphite powder as a mixture of two different kind of coated graphite powders in average particle size from each other.

Aihara et al. teach an anode material for a lithium ion secondary battery comprising graphite powder (section 0122) where the graphite powder is a mixture of two different kinds of graphite powders different in average particle size from each other (section 0123). Aihara et al. further teach that the ratio of average particle sizes is 0.3 (section 0123). Therefore, one graphite powder having an average particle size of 25 μm will be mixed with another graphite powder having an average particle size of approximately 8 μm (7.5 μm).

The mixture of two different kinds of graphite powders as taught by Aihara et al. would be advantageous because of increased discharge capacity and discharge cycle properties (section 0028). Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the filling factor of the two different kinds of graphite powders by changing average particle size of the two different kinds of graphite powder because Aihara et al. teach the discharge capacity per unit volume can be varied depending on the filling factor of the anode material. (sections 0109-0111, see also drawing 41). Discovery of an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272 (CCPA 1980). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make an anode material for a lithium ion secondary battery of Yoon et al. with the mixture of two different kinds of graphite powders different in average particle size from each other because Aihara et al. teach resultant increase in discharge capacity and discharge cycle properties due to variation of the filling factor.

Regarding Claim 19, Yoon et al. teach the coated graphite powder is coated with carbonized material of thermoplastic resin of a carbonization yield of 10-20% (see Example 1 and Example 3), and Yoon et al. teach the ratio of thermoplastic to graphite powder (see Example 1 and Example 3).

Regarding Claim 20, Yoon et al. teach the thermoplastic resin may be polyvinyl alcohol (see claim 4).

Regarding Claim 28, Yoon et al. in view of Aihara et al. teach the anode material as recited above. It is noted that Claim 28 is a product-by-process claim. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed.Cir. 1985). The battery taught by Yoon et al. in view of Aihara et al. is obvious to that of Applicant's, and therefore, Applicant's process is not given patentable weight in this claim.

Response to Arguments

7. Applicant's arguments filed on March 26, 2008 have been fully considered, but they are not persuasive.

Applicant argues:

(a) the product of Yoon et al. and Applicant's invention are not similar because the coating of Yoon et al. is condensation-reacted and the coating of Applicant's invention is dry blended;

(b) Yoon et al. and Aihara et al. are not analogous because Aihara et al. do not teach an anode material comprising a graphite powder coated with a resin.

In response to Applicant's arguments:

(a) Examiner agrees with the difference between the method of Yoon et al., wherein the coating is applied in a liquid form, and the method found in the instant specification, wherein the graphite powder is dry blended with the coating precursor. However, it is

Examiner's position that the liquid precursor of Yoon et al. would inherently coat the inside of fine pores of the graphite material. Furthermore, after the initial application the coating precursor of Yoon et al. and the method in the instant application, both materials are heat treated at 1000 °C and 900 °C, respectively. It is noted that the melting temperature of polyvinyl alcohol is approximately 230 °C (see attached polyvinyl properties document). Therefore even though the precursor materials are initially applied in different manners, in both methods the resin will melt, which Examiner believes would further introduce the material in to fine pores.

(b) Both Yoon et al. and Aihara et al. are concerned with negative electrode active materials for use in lithium secondary battery, and Aihara et al. does not require an uncoated graphite for use in their invention. Therefore, Examiner finds no teaching from Yoon et al. and Aihara et al. illustrating that the invention or teachings of one cannot be used with the invention or teachings of the other. A prior art reference is analogous if the reference is in the field of Applicant's endeavor or, if not, the reference is reasonably pertinent to the particular problem with which the inventor was concerned. *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

zpb

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795